

Preface

'O'brethren, 'I cried, 'who through a hundred thousand dangers have reached the West, deny not to this the brief vigil of your senses that remains, experience of the unpeopled world behind the sun. Consider your origin. Ye were not formed to live like brutes, but to follow virtue and knowledge.Inferno,xxvi,112.

ESSAY ON

Les histoires exactes des maladies, dit Frederic Hoffmann; et les observations de la principale

EPIDEMICS OF GRAECO-ROMAN TIMES

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Preface

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Les histoires exactes des maladies, dit Frédéric Hoffmann, et les observations faites avec soin, sont le principal fondement de la pathologie et de la thérapeutique; et si l'on veut porter la médecine au degré de perfection dont elle est susceptible, il faut suivre l'exemple des astronomes qui, par l'exact comparaison des observations qui ont été faites en différens temps sur le mouvement des astres, sont parvenus à déterminer leur cours et leurs diverses positions respectives, même cent ans à l'avance. Si donc les medecins observaient avec attention tout ce qui a rapport à la production, au cours et au traitement des maladies; s'ils rendaient leurs observations publiques, notre art acquerrait une certaine perfection, non-seulement pour prédire le cours des maladies, mais encore pour prévenir et les détourner. ...Histoire Medicale. J.A.F.Ozanam. (1817)

INTRODUCTION.

Infectious diseases are the expression of the constant struggle which has been waging, from time lost in the mists of mans creation, between man and animals on the one side and the causitive organism on the other. Until recent years the laurels have gone to the crown of the microbe the identification of which has not been revealed to the investigator.

It is to ~~Eracastorius~~ of Verona of the 16th century, the advanced ~~views~~ of Von Plenc~~az~~ two centuries later that we owe a great debt. Their donation to science lay in the fact that they believed disease to have a microbial origin. It is said also that Kircher had perceived minute worms by the aid of a compound microscope, in the blood of patients suffering from plague 1659. This however is doubtful with the type of apparatus available at that time. To Von Leeuwenhock must go the credit for microbiology on a firm basis of direct observation 1683.

Between the years 1822 - 1895 there was a great period of real development in the field of bacteriology. Brassiex, Dovaine and Pollender et al making isolated observations just as Schul~~tze~~, Dusch, Schrueder et all initiated technical methods which Louis Pasteur applied in his research. This great investigator~~or~~ settled the fundamental questions, above all developing the most invaluable technique of bacter~~cto~~ cultivation which has given his fellow men the key

to the greater part of the microbial world. It would be incomplete in this list of immortal names not to mention Kikassato when at Hong Kong 1894 revealed the cause of plague. (*Bacillus pestes*)

Some Conceptions of Disease in the Ancient World

Perhaps the oldest disease which has received the greatest attention, is leprosy, which is mentioned in the Old Testament. (Lv. 13⁶. Nu. 5²) According to Blakely⁽¹⁾ in his works on the Medicine of the Old Testament the leprosy of the Bible may not or may have been true leprosy. The term 'leprous' was applied to any rough scaly, dry condition of the skin and was accordingly confused with syphilis, tuberculosis and frequently not differentiated from eczema, ringworm or *psoriasis*.⁽²⁾

There is the incidence of the four leprous men at the entering in of the gate, and they said one to another "Why sit we here and die". Again in Leviticus 13⁴⁶ "he shall dwell alone, without the camp shall his habitation be". It is possible from the interpretation that the case of the four 'leprous' men may have been a skin condition resulting from avitaminosis caused by famine which was a common happening in these ancient times. Hospitals were not known, the sick except for the 'lepers' were cared for

(1) 1915 Vol LXX vii. 10 W 23 p. 934. & foll.

(2) Ex. 4⁸ Nu. 12.10. 2 Kg. 7.

at home. The dead were burned, buried or placed in a sepulchre. Embalming not being employed by the Hebrews as a method of preservation after death. Among these early peoples medical practice lay in the hands of the priesthood alone; the latter acted among the Hebrews as sanitary police, observing isolating. These duties appear to be distinct from the practice of physicians.

Other evidence of early diseases is also to be found in the Sanskrit document, the Rig-Veda. Spells incantations apparently were the basis of the curative course. Our knowledge however of the Hindu medicine in ancient times is both inaccurate and incomplete. (3) The nature of these diseases can only be interpreted in the light of modern knowledge of signs and symptoms.

In the great poem of 'Iliad' Homer writes of Chryses appealing to Apollo to avenge the ravishing of his daughter, invokes him, as the god of the Silver Bow. Apollo hears his prayer and:-

Down from Olympus heights he passed, his heart
 Burning with wrath: behind his shoulders hung
 His bow and ample quiver: At his back
 Rattled the fateful arrows as he moved.
 Like the night cloud he passed: and from afar.
 He bent against ships and sped the bolt
 And fierce and deadly twanged the silver bow.

First on the mules and dogs, on man the last
 Was poured the arrowy storm. And through the camp
 Constant and numerous blazed the funeral fires
 Nine days the heavenly archer on the troops
 Hurl'd his dread shafts. (Translation : Derby)

In this poem Apollo sends the pestilence as a punishment for sin. This is obviously the recording of an epizootic epidemic which first affected mules and dogs, passing laterly to man.

Again in another extract Achilles advises the summoning of some prophet or priest to say what propitiatory sacrifices have been neglected.

'If for neglected hefta tombs or prayers.

He blames us or if fat of lambs and goats

May soothe his anger and the plague assuage'

Homer's plague marks the stage in which prayer and sacrifice have displaced magic in the struggle with pestilence. Prayers, offerings, expiation with sacrifice to be restored to favour. After purification these were to be made to the gods, and when the plague had been stayed, the people could again join in the glad rejoicings and eucharistic feast of meat offerings, libations of red wine, the whole assemblage taking it "with" the god, crowning the cups with flowers and chanting hymns of praise.

Sophocles on the other hand describes the 'Theban Plague' and is the first writer to attempt a description

of the pestilence in the play *Oedipus Tyrannus* (429-420 BC) There was "blight of crops, murrain among cattle and death among men". Here in contrast to Homer is a date which can localise the approximate time of such a pestilence. No one knows exactly the dates of Homer's birth or death and furthermore where he was born. Herodotus puts Homer and Hesiod very definitely at a date 400 years before himself approximately 850 B.C.

The picture painted by Sophocles of the 'Theban Plague' is one in which the pestilence is set by the gods as a punishment for sin and atonement was to be sought for at *Delphi*; pending this knowledge, supplication was to be made at Athena. Artemus and Apollo were the deities who controlled the scourges and pestilence of man. Apollo was only appealed to, to dispel the evil while at the same time was the god who illuminated the dark places of the mind. In Homer however Apollo "was" the god who dispelled the plague and was indeed the god of light.

The Hebrews too believed that to incur the wrath of Yahweh, the supreme healer, was to bring injury and disease as a direct punishment for sin.

This idea of the gods being responsible agents for plagues and fearful pestilences appears to be of ancient origin. In the prayer of Atharvaveda (1500 B.C.) again:

Oh Bhava and Sava (synonyms for Rudra) be merciful,
do not attack us: ye lords of beings, lords of cattle.
reverence be to you twain. Discharge not your

arrow even after it has been laid (on the bow) and has been drawn! destroy not our bipeds (4) and our quadrupeds.

The protective gods were Vaya (wind) who, was supposed to bend the points of the enemies' bows, Indra who broke their arms, Aditya who led their missiles astray (Sun) and finally Krandramas (Moon) to bar the way of the enemy. (5)

Man has as far as it is known always sought for the reasons of dire diseases and has resolved to sacrifice on the alter of this or that god, both humans and animals in order to rid the community of the plague, famine or drought. It is said that when Marseilles, the brilliant Greek colony, was ravaged by plague, a man of the poorer classes had to offer himself as a human scapegoat: This unfortunate man was maintained at the public expense, well fed, and at the end of a year was dressed in sacred garments adorned by holy branches, and led through the city while the evils of the people were showered upon his head by prayer and oath. At the end of the ceremonial march he was cast out of the city and stoned to death. Andrew Lang however disagrees with the evidence of Frazer on this point. In Athens too a number of so called useless and

(4) Trans. Bloomfield. vii x 12 tr.

(5) Athar vaveda. Vol. VI. 10.

degraded persons were maintained at the public expense and when plagues, famine or draught reared their ugly heads, the Athenians sacrificed two human scapegoats, one for the men part of the community and one for the woman. (6) A much milder form of this practice is to be found in the time of Plutarch. Here slaves were beaten with rods of the 'Angnus castus' and were turned out with the words - "Out with hunger and in with wealth and health" (ref. Aristophanes 'Frogs' 734 and 'Knlyts' 1136)

Early Noteable Plagues

The first classical distinct description of infection in literature is to be found in the immortal account given by Thucydides of the epidemic which raged in and about Athens during the second year of the Peloponnesian War 430 B.C.

SOCIAL CONDITIONS

In the private houses there were collections of rooms opening off a central court, through which came light and air; there were no windows on the outside wall of unbaked bricks. The floors were of beaten earth with no covering while outside the door the street was a dumping place for refuse. Social activity was at its highest in the market place or gymnasium. Yet it is strange that Pericles said that the ideals of Athens could be best expressed by building beautiful temples for the gods, and there is no other example of Greek Architecture at its best than the

(6) Frazer's 'Golden Bough'. Chap: Scapegoat.Vol.vi.

work of the architects Ictinus, Callicrates and Phidias the sculptor, in the shape of the temple of Athena Parthenos on the Acropolis at Athens which must have looked down upon such squalor.

Then what of the clothes these Greeks wore. Their normal dress consisted of two oblong pieces of woollen stuff; an undergarment, or tunic, doubled round the body and pinned over the shoulder, with a girdle at the waist; a cloak was usually wrapped round the body in the chill of winter. Men wore a tunic to the knee, women to the feet. Frequently the dress was adjusted to expose the shoulder and for very strenuous exercises they stripped completely.

The well to do Greek would have a daily bath, - a generous use of oil to remove the dirt, with a cold douche to follow. Warm baths were looked down upon.

As to his eating habits, the Greek took his main meal in the evening but as they were not heavy eaters this was frugal enough. Meat, eggs, fish, cheese, vegetables, garlic and onions were common place while olive oil was used to drench most dishes.

Social conditions changed but little in the Graeco-Roman era so that the epidemic stands out as a pattern which was closely adhered to in cities besieged by the enemy in later times.

Walled cities have always been a place of refuge in time of war and so it was with Athens. The inhabitants of

Athens flocked within the walls bringing with them moveable properties and their most prized possessions. It has been said that many sent their domestic animals to Euboea and the neighbouring islands so that the added horror of an epizootic plague was averted. There were few if any houses at all to receive the newcomers. Vacant spaces within the walls were converted to camping grounds. Families were housed in the towers of the great walls, in stifling cabins, sheds and many slept in tents.

There were three obvious and disastrous consequences, the sanitary arrangements, feeding and water supplies were inadequate.

In charge of the defence of the city was the Greek general Pericles.

It was said the plague first began in "ports of Ethiopia" later traversed Egypt and Libya, suddenly falling upon Athens, first attacking the population of the Piraeus the seaport of Athens and which had three harbours. In ancient times it was the abode of the more democratic of the Athenian populace and also many foreigners. (6a)

In despair however the stricken populace vented their anger on Pericles just as persons in a delirium. (7)

:- In speech Pericles weaned them to a better mind :-

The general himself had suffered a great loss in the death of his two sons Xanthippus and Paralus, his sister

(6a) Hamsworth Encyclopedia Vol. vi.

(7) Plutarchs Life of Pericles.

and many relatives. The death of Pericles left him no legitimate heir to maintain the family and hereditary sacred rights. "That blow" says Plutarch, "crushed him to the earth". Soon after the pestilence laid hold of Pericles. His ailment was slight but protracted through a variety of phases, which slowly wasted his strength and undermined the vigour of his active body. Accordingly to Plutarch and Theophrastus in his 'Ethics' his mind was free from any taint of insanity. (8)

"The sacred places were full of corpses of persons that had died there for as the disaster passed all bounds, men not knowing what might become of them, became utterly careless of everything sacred or profane"

. Sometimes getting a start of those who had raised a pile, they threw their own dead body upon the strangers' pyre and ignited it; sometimes they tossed the corpse which they were carrying on the top of another that was burning, and so went off.

Men now coolly ventured on what they had formerly done in a corner, and not just as they pleased, seeing the rapid transitions produced by persons in prosperity suddenly dying and those who before had nothing succeeding to their property. So they resolved to spend quickly and enjoy themselves, regarding their lives and riches as alike things of the day.

(8) Plutarch's Lives Pericles. Translated Barnadotte Perrin. 1914-26

. . . fear of gods or law of man there was none
to restrain them . . .

. . . no one expected to live to be brought to
trial for his offences . . . (8a)

Here then was the same Greek who had argued about
the merits of Sophocles, of Euripides and who had laughed
at the parody of Aristophanes. They had learned Homer,
appreciated music, become aware of the eternal truths,
threw the javelin skilfully gaining a place in the civilised
world which had never been surpassed previously.

This picture of social degradation was not however
confined to the Greeks. It happened in Rome, and
Antioch, a few years later. In the plagues which swept
Europe in the Middle Ages, the reaction was the same.
Wealth became a dire tragedy. To appease the god, to
solve the conscience, above all to escape the terrible
plague was most important. Did not the rich burgher
load his choicest earthly goods on a wheel barrow and throw
them over the Monastery walls when the gates had been
closed against him ? (8b)

The greatest probability of the entry of this
pestilence to Athens was by means of the Piraeus. It may
or may not have been carried by rats, bugs, fleas, ticks
or even it may have been a virus infection.

(8a) History of Peloponnesian Wars. Translated
R. Crawley 1876.

(8b) Hecker's EPIDEMICS of the Middle Ages

The garbage in the streets, the open rain water tanks, the overcrowding of the population, the lack of sufficient good food, the healthy carrier, the carrier convalescent, together with the presence of the unburied in the streets were doubtless all vital factors in this terrible pestilence which killed thousands of people each day.

Medical writers have attempted to identify the nature of the 'Plague of Athens' and have attested it to be typhus, smallpox, influenza, erysipelas, scarlet fever and measles.

(9)

E.W. Goodall favours typhus or smallpox. In evidence there was a universal eruption of 'small blisters and ulcers' and that "the malady, starting from the head where it was first seated, passed down until it spread through the whole body", (This may be taken in the manner in which the smallpox invades the skin) on the other hand the Hippocratic Collection does not even hint at this possibility.

Patients were suddenly seized with the grip of the pestilence. Headaches, redness before the eyes, inflammation of the tongue and pharynx, sneezing, looseness and irritating cough, all accompanied the onset of this disease. Together with the above were intestinal upset, vomiting, diarrhoea, delirium with death on the seventh or ninth day.

(9) Short History of Infectious Diseases.

At the height of the fever the body was covered with bright red spots many of which ulcerated: one of the severe cases which recovered had necrosis of the fingers, toes and genital organs: of the few who recovered from this terrible pestilence extreme weakness and blindness in many instances were the badges of the convalescent.

(10)

Zinsser has given typhus, bubonic and pneumonic plague together with smallpox as the possibilities in the diagnosis. Haeser on the other hand favours typhus fever while Hecker agrees in part with Haeser, adding that the typhus at this period changed its characteristics in later years. Additional information by J.F.D.Shrewsbury had it that the disease was measles.

(11)

(12)

It must be remembered that Thucydides had no medical training, his detail suggests a new disease which had a large and disastrous impact on the society as a whole, and he also states that physicians of his day had no knowledge of the nature of this pestilence.

Perhaps one of the most accurate translations of the works of Thucydides is by Jowette.

(13)

(10) Rats Lice and History.

(11) Epidemic of the Middle Ages.

(12) Plague of Athens. Bull Hist. med 24.p.1-25 Jan-Feb. 50 p.1-25.

(13) 1881 Oxford.

He employed the term '~~pustule~~' which according to Nelson⁽¹⁴⁾ signified the eruption of the skin accompanied by a prominence, and corresponds very closely to our own word 'eruption'. It had no reference to the contents of the prominence as at the present day, and was not as it is with us, a prominence of the cuticle filled with pus. Whatever the nature of the lesion which Thucydides meant it is doubtful if we could truly interpretate his description of the 'exanthem'.

There was however a very important reaction of the affected persons as Athens, they craved for water and immersed themselves in the waters of the public places. All appeared to be in the midst of being consumed by a terrible internal heat which drove the unfortunates into a delirium.

⁽¹⁵⁾
Prescott notes that the Spanish Conquerors of Mexico witnessed a plague of smallpox as they fought towards the Aztecs Capital which was built in the centre of a lake. In this instance the affected ones did not jump into the water: Again in the History of the Plymouth Settlement⁽¹⁶⁾ it was noticed that although the settlement was on the sea board, smallpox patients did not throw themselves into the sea.

J.F.D. Shrewsbury (see 12) cites the account given by the Reverend Mr. Webb of measles in 1875 in the Fijl Islands.

(14) Dermo-Pathology of Belsus. Brit.Med.Jnl.Oct.24
1863

(15) History of Small Pox.

(16) Bradford. Hist. of Plymouth Settlement

In this epidemic the population was decimated. The inhabitants were suspicious of the European treatment and 'they preferred rather when overtaken by the fever, and blurred by the rash, to crawl out of their houses and cool their bodies by lying on the damp ground, or in the bed of the nearest creek'. All those who did this, speedily developed dysentery or pneumonia and died miserably. Again in the Plague of Individuals A.D. 1577 at Oxford: 600 persons sickened in one night between the 6th and 12th of August. 510 persons died. Those seized by the disease "left their beds, occasioned by the rage of the disease and pain, would drive their keepers or nurses out of their presence, others like madmen, would run about the streets, markets, lanes and other places, some again would plunge head long into deep waters. J.F.D. Shrewsbury concludes with

- the catarrhal nature of the disease.
- ocular complications, formerly both common and dangerous.
(17)
- Gangrene of the skin, and genitals may follow measles.
- Very offensive odour accompanying noma would be expected.
(18)

Higgins also adds that some birds and animals are known to have illnesses resembling measles.

Thucydides states "the birds and animals which fed on

(17) Gunn. Brit. Encyclo. Med. Pract. Vol viii. London.

(18) Higgins. Measles. Oxford Medicine. Vol.5. N.York Oxford Univ. Press.

human flesh, although so many bodies were lying unburied, either never came near or died if they touched them.

Whatever the true nature of this plague, its importance lies in the fact that it gives the historian, both classical and medical an accurate picture of life at that time, and the terrible devastation of a society at war. Both military and civil policies were disorganised, and demoralisation of the Athenians as a whole was rife. The plague engendered social and political canker which continued to fester long after the immediate effects had worn off.

Strange though it may appear, it is said that Hippocrates, whose *Epidemics* I. and III are now classical examples of medical description, does not make any mention of the "Athenian Plague" although it is believed he was resident at Thasos at the time.

"HIPPOCRATES"

Perhaps it would be expedient at this point to write for a little on the "Father of Medicine" Hippocrates. This title has also gone to Alcmaeon of Croton, a younger contemporary of Pythagorus.

Hippocrates was also almost a contemporary of Socrates both men belonging to the classical or Periclean Age of Greece.

To Hippocrates the life-process was an interplay

between the individual and the environment according to the "Humoral Theory" which had been thought long before his age. The body contained fluids which were blood, phlegm, yellow and black bile. According to Hippocrates and the classical theory, health was a proper balance of these while disease was an improper balance. The correct mixture was so termed "Eucrasia" or "Crisis" of body fluids. The Greeks thought that certain people had a natural tendency to any one of these, that is to say different temperaments.

'Sanguineous, phlegmatic, bilious, melancholic' Qualities such as dryness or cold, heat or dampness, when in great excess could affect the humours in the patients body. The 'Vis Medicatrix Naturae' was the natural tendency of the body to heal itself, in which the humours were returned to their correct place and true proportion. The cure or 'pepsis' was the cooking or ripening of the crude matter which was carried on by means of the 'innate heat' resulting from the restoration of the 'eucrasia' and the elimination of the waste products 'the perittomata'. In the acute diseases (mostly malaria in Greece) the elimination or 'crisis' of offending humours tended to take place during critical days, being effected by sweating - purging - urination - as the chief agents. In practice "pepsis" or "coction" amounted to a kind of digestion of the environment by the organism.

Stages called "apepsia", "pepsis", "crisis" marked progression towards recovery.

In the chronic cases and conditions relation to the "critical days" was less clear, a more gradual resolution "lysis" of disease took place.

A third way of cure was by "apostasis", a type of migration and settlement in other parts.

In his treatment Hippocrates saw the organism or "physis" very competent to solve its own problems and in so doing it may endure a certain amount of disease. Hence it was thought provident to leave it alone, or if the conditions were too difficult, the physician could modify them. Healthy surroundings, good food, exercise would cause the body to regain its lost vigour. Drugs when necessary could be applied according to the humour in need of treatment. For example too much bile or phlegm could be cured by cholagogues and phlegmatagogues respectively.

(19)

Hippocrates was first and foremost a practitioner, his outlook that of a pragmatist. His teachings had far reaching effects. He was succeeded by the so called Dogmatists who made the principles or dogmata which he discovered, as the basis of their science or practice. Even up to the Middle Ages, the voice of the Dogmatist could be loudly heard.

(19) Greek Medicine. A.J. Brook.

Galen claimed that the mutilations to the Hippocratic text was due to the fact that the agents of the *Attilid* kings who were avid collectors, were unscrupulous and purchased spurious and supposedly genuine works. The Aristotilean collection however had been hidden first at Stepsis in the Troad and thence buried for 200 years a prey to moth and worm. "Blattorum et tinerum epulae" (Stäbo)

It is interesting to note that the library of the Attilid kings was composed of some 50,000 books, and was founded by Eumenes II at Pergamum. In B.C. 133 the rule of that town ended and the library passed under the will of the king to Rome. Later it formed part of a gift from Antony to Cleopatra. This was perhaps why Galen went to Alexandria.

Investigators have surmised, even claimed Galen's personal additions to the Hippocrates Collection. These two great men lived almost 6 centuries apart, but if Galen recognised signs and symptoms very closely resembling those in the epidemics of the Collection, it may be or may not be true that the epidemic diseases which existed at the time of Hippocrates also were raging at the time of Galen during the Graeco Roman period.

This supposition also applied to the treatments accorded to the Hippocratic Collection. Were those of the 'Father of Medicine' or of Galen? A fundamental question indeed.

HIPPOCRATES COLLECTION

(20)

According to E.W. Goodall three diseases in the Hippocratic Collection are to be identified with certainty. These are mumps, puerperal fever, erysipelas with typhus as a highly probable condition of the time.

Mumps in an epidemic form broke out in Thasos. Many had swellings beside one ear or both and most cases were attended by fever, but confinement to bed was not a necessary expedient. One or two patients felt only a slight rise of temperature and the swellings subsided without harm. No suppuration took place, such as attends swellings of their origin:

Characteristics of the swellings:

These were flabby, large, spreading without inflammation or pain, and in every case disappeared without leaving a sign, i.e. no crisis.

Sufferers were youths, young men, men in their prime and those who usually attended the wrestling school or gymnasium. [Two women were attacked.] Dry cough, which brought up nothing, left the voice hoarse. Soon after painful inflammations occurred in one or both testicles accompanied by fever, but in others not so. (21)

Puerperal Fever These cases all followed delivery or miscarriage and all with the exception of one were fatal. (22)

(20) Infectious Diseases and Epidemiology in the Hippocrates Collection. Proc. Roy. Soc. Med. 27 mor 34. 523/534.

(21) Epid. 1.1.

(22) Epid. 1.3. Epid. 1. cases 4,5,9. Epid. 3. cases 21.12.

Erysipelas There is an account of the infection which manifested itself in small wounds spreading all over the body, many of these resulted in suppuration, loss of much tissue or even a limb.

The case of Creto of Thasos is cited thus:

"While walking about the sufferer was seized with a violent pain in the great toe: He took to bed, the same day with shivering and nausea, and regained a little warmth, but at night he was delirious. On the second day, there was swelling of the whole foot and redness about the ankles with distended blood blisters. Acute fever and delirium. Alvine discharges from the mouth bilious and rather frequent. He died on the second day."

Typhus Fever The fever was present one summer at Perinthos on the south shore of the sea of Marmora. The fever usually ended on the 14th day. A few cases had sweating accompanied by shivering. Eruptions appeared on many patients on or about the 7th, 8th or 9th day. These consisted of miliary asperities resembling gnar bites and was peculiarly confined mostly to women. Other symptoms were diarrhoea, sweating deafness, insomnia while in the more affected persons coma was not uncommon. Splenic enlargement was absent. It also appears that there were no fatal cases. Relapses were not common which suggests an outbreak of mild form of typhus.

(24)

Again Zinsser quotes the case of Silenus who lived near the platform, and who was attracted by a fever as the result of fatigue and excess drinking.

From the first he had a pain in the back, a headache, and pain in the neck. A feeling of pressure in the abdomen; insomnia with delirium were additional symptoms. On the 7th and 8th day severe sweating, accompanied by an eruption of spherical and non suppurative red spots. On the 11th day the patient died. One would expect such a series of events in a severe case of typhus.

Here however there is an eternal struggle between the diagnostician and the translator. The whole case pivots on the words ὅσων ἰσχυοῦ which translated by Farr means 'like vesicles' while de Mercy also has similar views i.e.

"Semblable aux varices"

Professor Culick finds no other occurrence of the word "Iov Ooc" in the Hippocratic Collection.

(26)

Aristotle on the other hand quotes that "Ἰοὺς ὅοις" could occur with or without pus. In problem xxvi.3. he enquires why they occur mostly on the face. Again in problem xxxiv. 4. he says excrescences literally "hail" or knots on the tongue are like "Ἰοὺς ὅοις". Other sources such as Galen (27) quotes that boils like "Ἰοὺς ὅοις" come from the skin moistures (juices called by him) and that they are rather hard and crude or inflamed.

(24) RATS. LICE AND HISTORY

(25) Epid. 1. Case ii.

(26) Aristotle Hist. Animal V.31.

(27) Galen. x11824 ed. Kahn.

The writer has quoted only a few of the possible diagnoses from the Hippocrates Collection. Learned modern medical writers have quoted in addition with conviction of their own beliefs the existence of diptheria, enteric fever, malarias, meningites, tuberculosis, pneumonia, cholera, relapsing fever, and typhoid fever in this era of history.

The writer has ^{also} attempted to point out the importance of the recordings of diseases which have taken place before the era of the Graeco-Roman times. They are as far as it is known faithful records by persons such as Thucydides and Hippocrates, men of learning and inveterate searches after the truth.

History has only too often been perverted to the purpose of the pure partisan or the propagandist, but with all the variety of points of view, it is at least curious that the influence of disease on the history of a people has been entirely overlooked.

Almost every passage of history has words to the effect:

"When the Angel of Death spread his wings to the blast,

And breathed in the face of the foe as he passed . . .

By this means the siege was suddenly raised, or the hostile army was rapidly destroyed. Yet it is also true that no less terrible consequences of more remote and less obvious world wide epidemics have failed to gain recognition. Thos. Hume devotes sixteen lines to the 'Black Death', and seems

prompted to mention that it interrupted the festivities held to celebrate the continental victories of the English king Edward, and it prolonged the truce entered into (28) between him and the king of France.

Thus these medical recordings are gems in our history, adding to our avaricious knowledge for the truth.

Approximately in the year 396 B.C. an epidemic described by Diodorus Siculus, broke out among the Carthaginians as they were besieged in Syracuse about 40 years after the outbreak in Attica.

Diodorus relates that "the epidemic first began before sunrise, because of the cold breezes from the water, the soldiers had chills; in the middle of the day, there was burning heat. During the first stage of the disease there was a catarrh followed by a swelling in the throat and shortly after this a fever set in. The patients had pains in the back and a heavy feeling in the limbs, soon followed by a dysentary and blisters over the whole surface of the body. "After this some became delirious." Death occurred on the 5th or 6th day in most cases. The epidemic may have been severe confluent small pox.

Diodorus attributes the disease to the multitude gathered together in one place, to the dryness of the summer and to the 'hollow marshy' nature of the ground. The outbreak was enormous taking the lives of thousands.

(28) Brit. Med. Jnl. 20 Aug. 1927. p. 305-7
Cullen G. Matheson

This epidemic was of the greatest importance in history. It meant that in less than 100 years before the outbreak of the Punic Wars in which the early fighting took place in Sicily, Carthage was prevented by this epidemic from completely controlling Sicily with a powerful army of occupation and well organised naval basis.

Rome had the greatest difficulty in conquering the Carthaginians and a decisive victory of the latter may well have meant that the military and administrative civilisation of Rome would have been replaced by that of a commercial and Semetic culture of Carthage.

Graeco-Roman Period

The first of the Graeco-Roman period may be defined as extending from 146 B.C. to the close of the Roman Republic. At the beginning the name of one is prominent more so than any of his contemporaries, it was that of Polybius. The subject of Polybius (205-120 B.C.) was the History of the Roman Conquest (264-146 B.C.). His style is straightforward and free from florid rhetoric of the time. He is distinguished because he is the last Greek writer who in some measure retains the spirit of the old citizen life. He chose his subject, not because it gave scope to learning or literary skill, but with a motive alien to that which prompted the History of Thucydides namely because as a Greek citizen he felt

intensely the political importance of these wars which had given Rome mastery of the world.

The chief history which followed was the Universal History of Diodorus Siculus (50 B.C.). This resembled that of Polybius in recognising Rome as the political centre of the earth. In all else Diodorus represents the new age in which the Greek historian had no longer the practical knowledge and insight of a traveller, a soldier or a statesman, but only diligence and usually dullness of a laborious compiler.

The second part of the Graeco-Roman era extended from 30 B.C. to 529 A.D. approximately.

From Augustus to Justinian there was a very prolific century of Greek literature. It is an era in which the Greek language was diffused either as a medium of intercourse or as an established branch of the higher education, and was co-extensive with the empire itself.

If there is any one characteristic which broadly distinguishes the Greek literature of the five centuries, it is its absence of originality either in form or in matter.

Lucian is, in his way an exception and his great popularity, the only Greek writer of the period, except 'Plutarch' who has been widely popular, and who illustrates the flatness of arid level above which he stands.

Production of literature in this period was partly due to

the fact that there was no open political careers. Never probably was literature so important as a resource for educated men, and the habit of reading or reciting before friendly or obsequious audiences swelled the number of writers whose taste it had been cultivated to point just short of perceiving that they ought not to write. ©

146 B.C. was an important year. During this year Polybius died and Rome destroyed Corinth. Greek freedom was at an end until 1834: and half the Mediterranean, all the shore lands west of the Aegean belonged to Rome, and the turn of the East was coming.

Hannibal had been driven from Italy and Carthage well beaten. Rome, who never forgot, had also remembered Philip V, king of Macedon who had given her a lot of worry during the war with Hannibal. Philip the so called incomparable meddler and whose ambition it was to become a 'universal king' had done ceaseless harm to the Greek states. He was called to account, by the Roman general Flamininus, for his misdeeds. At the battle of Cynoscephalae (197 B.C.), Philip was defeated but was left a vassal king in his own country to prevent the Celts and others from invading the Mediterranean lands. Flamininus created a great sensation at the Isthmian Games by proclaiming that all Greeks should be free.

Antiochus 'the Great' came conquering from Syria, and went back, beaten at Thermopylae that immortal scene (191 B.C.); he was followed up and beaten again in

Asia. Rome treated him as she did Philip, by cutting down his kingdom, gave him a frontier and strengthened the powers between her territory and that of Antiochus.

Another Antiochus, Epiphanes this time had decided to annex Egypt from the baby king Ptolemy. Rome heard of this, and her Senator Popillius had drawn with his staff a circle in the sand round the feet of Epiphanes who decided wisely to go home. No doubt the news of the defeat of Perseus the Macedon, the son of Philip had added wings to his flight.

Thus in half a century, Rome was in control of the world; and it was the luckiest stroke of fortune ever made for the Greeks, that they were knocked over so quickly and so easily. So said Polybius.

Here then at the threshold of the Graeco-Roman period Rome had arrived in two generations by the stepping stones of Hannibal's defeat, the subjugation of Carthage, the defeat of Macedon and above all the annexation of Greek freedom. Rome settled down to administration of her newly gained states, but this proved to be a more difficult task than she had anticipated.

In the year 140 B.C., the war of Viriathus having been concluded, the proconsul Q. Pompeius Rufus commenced blockading Numantia, (now Spain) and he determined to alter the course of the Douro and so inundate the surrounding country and spoil the atmosphere by its moist exhalations. Famine would then prevail. The Numantians

however resisted his attempts, as they had forseen his intentions. They laid up stores of food which they had stolen from the intercepting Roman legions who fell prey to their own devices. A malignant type of dysentery broke out among the Romans and caused a great mortality equally devastating as that which had hold of the army (28a) of Lucullus.

Some ten years later the army of Scipio Aemilianus called the Numantine, suffered a severe catastrophe in the manner of a ravaging epizootic plague which killed horses, men, cattle. It is believed to have begun when his army was digging wells in Palestine and the water it is thought was the cause of the outbreak. It was thought advisable to change the army headquarters to the plains of Numantia which he had quite recently devastated. Scipio Aemilianus had admirable rules for hygiene for his army.

The true nature of these so called plagues or pestilences will never be known but one thing is certain their impact on the society was sudden, with an extremely high rate of mortality.

Orosius, Livy, and Justin have given accounts of a great mortality in Africa about 120 B.C. They attributed pestilence to the stench from dead locusts the carcasses of which created a great offensive stench. The worst clouds

(28a) History of Epidemic Pestilences by Bascombe E.
8d 1851.

had been brought over by an east wind and in their manner wrought havoc among the green plants wherever they settled. Subsequently the locusts were driven by a south wind into the Mediterranean waters wherein the carcasses putrefied. (29) Figures have it that 800,000 persons died in Numidia, 200,000 perishing in Carthage alone.

At this time Rome was extending her boundaries. Gaul soon came under the heel of Julius Caesar, while Britain became another outpost in this the greatest empire of the ancient world. Spain was held by the Pompeians and Caesar hurried there, after the escape of his mortal enemy Pompey, 'to meet' he said, 'an army without a leader, and I shall return to meet a leader without an army.' He had to besiege Marseilles, which he took, and he beat his enemies at Ilerda (modern Lerida) in Spain. He had not only to fight the Pompeians but famine and pestilence as well as weather. Epidemic pestilences broke out while it is said 'the very atmosphere was surcharged with moisture and poisonous exhalations'. Rivers overflowed their banks to flood the countryside, crops were destroyed, flocks were withdrawn to safety. Had it not been for 500 Illecaones who escorted the food to the camp of Caesar, the Roman troops would have surely perished.

(29) History of Portugal and Gallica. Lord Carnarvon.

In the closing years of the first part of the Graeco-Roman period in the time of Mark Antony, Dion Cassius records a pestilence which continued for 5 years destroying large numbers of inhabitants of Jerusalem. It is also written of by Nuestro Alonso of Treyllas in his History of Pestilences. Tacitus too also given an account of epidemic pestilence which took place in the East and Asia Minor. A severe earthquake had taken place about that time while a comet with a great tail was believed to have hurled down twelve cities at once.

These descriptions are too meagre to elucidate a competent diagnosis.

Late in the reign of Tiberius, a young carpenter, named Jesus, left his home at Nazareth in Galilee, the kingdom of Herod, and went about the country teaching the doctrine of the true God and healing the sick. Fierce nationalism of the old religion He swept away, substituting for it a gospel of meekness and love. Caiaphas and Pilate had soon done their work, and in a remarkably short time after His mock trial He was put to death between two thieves on a hill called Calvary. All thought that this doctrine which the man Jesus had taught was at an end, but it was not so for the very crucifixion of Jesus was the climax of His ministry. Rome was soon to fall into decay but the teaching of the Christ, the promised Messiah, the son of the Living God, shone and still shines more than a thousand years after the Roman legions are but a memory.

Soon after the death of Jesus the universe seemed to be seized by a series of earthquakes and terrible tempests. In 40 A.D. Etna erupted and frightened Caligula from Sicily, while Babylon in this era was almost totally depopulated. 00 people died (53 A.D.). The houses were

In the struggle for succession as head of the Roman Empire, Nero the megalomaniac was chosen. He had succeeded the well meaning pedant, Claudius the Conquerer of Britain. Nero was more concerned with his own amusements and his aspirations in attempting to become a great actor on the public stage. Not only did this shock the populace but he murdered his own mother, putting an end to the dynasty by killing off as many relations who might be regarded as possible rivals to himself. It was amid such scemes that another epidemic broke and in the cities of Italy. Tacitus described it as 'extraordinary destructive'. There were corpses in all the houses, and the streets were filled with funeral processions. Slaves as well as citizens died. Many who had mourned a beloved victim died themselves with such rapidity that they were carried to the same pyre as those they had mourned. (54 A.D.)

(29a)

Among the Huns some thirty years later an epidemic which affected both men and horses broke out. Many are of the opinion that it was 'anthrax'. This period saw a succession of such epidemics. 30,000 Huns, with

(29a) Greek Medicine in Rome. Sir Clifford Allbutt.

40,000 horses and 100,000 cattle apparently fell victims to this outbreak.

Pliny, Orosius, Tacitus and Philo all described epidemics of this first century of the Christian era. At Rome 30,000 people died (88 A.D.). The houses were filled with dead, funeral processions formed an incessant stream to the place of burial. In June of that year a great comet appeared, and in the following November Vesuvius erupted to fill the air with 'sulphurous' vapours, which it was claimed was a causative factor of these dreadful diseases.

Soon this epidemic reached England and in 92 A.D., 150,000 people died in Scotland probably from the far reaching fingers of this disease.

Philo, the Jewish philosopher, gave an account of the 'Toimic' pestilence in the same century.

He says, 'the clouds of dust falling on man and cattle produced over the whole skin a severe and intractable ulceration. The body immediately became tumid with efflorescence or purulent phlyctenae which appeared like blisters excited by a secret fire beneath, men necessarily undergoing much pain and a universal soreness from ulceration and in inflammation ($\phi\lambda\omicron\gamma\acute{\omega}\sigma\epsilon\omega\varsigma$) suffered not less in body than in mind by a severe affliction, for a continuous ulceration was observable from head to foot.

These severe earthquakes were not confined to the Mediterranean basin. From Shropshire in England to China

they could be felt. 45,000 people were reported to have died in Wales. The river Severn inundated drowning great numbers. Anitoch tumbled to the ground, Nicomedia and other cities were swallowed up while Caesorea and Necropolis suffered the same fate. In the year in which Galen was born (33 A.D.) a great drought fell upon England, the Thames almost drying up. Worse was to follow in the form of a pestilence which decimated the population.

Galen, born at Pergamum, was the son of a rich architect. His father wisely spent a great deal of money and effort on education for him. As a boy Galen learned the doctrines of Plato of Aristotle, and those of the Epicurean and the Stoic. After his father's death he went to Smyrna, Corinth and Alexandria. In the year 161 A.D. at the age of 28 he arrived in Rome. In this year too Antoninus Pius the Emperor died being succeeded by Marcus Aurelius.

While in Rome Galen became famous both for his demonstrations in anatomy and his popularity. The society in the city was at this time in a degenerating state, only a small improvement having taken place under the previous Emperor Antoninus. Wars were breaking out on the far flung borders of the Empire. It was indeed a quick-silver state and the legions marched hither and thither stemming the numerous inflows. Social decadence surely followed large scale wars.

At this time the chief schools in Rome were the Methodists and Erasistratean both of which were in a state of

degeneration. Their practitioners were badly educated, indolent and venal.

Galen was full of enthusiasm for the Hippocratic art. His friends were influential, two of the latter being Flavius Boethus and Eudemus the philosopher. His private practice became large while the Emperor Marcus Aurelius consulted him. At this period epidemics were breaking out in Rome and in the North among the drafted soldiers from Syria who had been called in to stem the German tribes on the Danube.

On his way home Galen visited Cyprus to collect ores of certain medical value, and in Palestine he acquired 'apobalsam' or juice balsam. (probably 'balm of Gilead'). No sooner had he reached home than he received a message from the Emperor summoning back. At this time Marcus Aurelius was at Aquileia with Verus preparing for a war against the Marcomanni.

A plague of unknown origin broke out making rapid strides among both rich and poor. Verus died of it while fleeing the city.

The Emperor wished Galen to go with him to the German wars but the latter made a plea that he had had a warning in a dream from the family god Asclepius who had told prognosticated disaster. Marcus accepted this excuse and left for his campaigns.

Galen remained in medical charge of the heir apparent Commodus and settled down to literary work. News came of the death of M. Aurelius at Vindobona on the Danube. Galen retained his court connections until the reign of Septimus

Severus, dying apparently at Rome or Pergamum.

Galen's fundamental contribution was to bring 'logos' or reason to bear on the essentially empirical system laid down by the 'Father of Medicine'. He contrasted with Hippocrates in his reason against experience. This is erroneous however. Galen was a logician, who undoubtedly added to the Hippocratic Corpus factual, clinical and physiological matter.

Like Hippocrates 'physis' to him meant the living organism, it however cannot often be so translated. Galen speaks of it as the physis which inhabits ($\delta\iota\omicron\lambda\chi\epsilon\iota$) the living organism i.e. the creative principle immanent within it. The 'physis' is really the 'Deus in nobis', mysteriously immanent and transcendent at the same time. His views like that of Aristotle is fundamentally teleological. In his works 'On the Utility of Parts' he proceeds from the Aristotelian dictum that 'nature does nothing in vain'. In that book he showed that for fulfilment of its function, that part could not have been better constructed. Structure according to Galen is entirely explained by utility.

It is essentially his teleology and physis - lore or physio-logy (in its aspect of theo-logy) which commended him as like views did Aristotle to the medieval church. Nineteenth century medical teaching, functionally materialistic scoffed at both these notions, but they will find their place in the reconstructed synthesis of the

(29) future. Galen's description was written at this

Dr. Moor^x argues that the contagion which broke out on the accession of Marcus Aurelius was typhus fever and described by Galen (A.D. 165). This epidemic resembled that of the plague at Athens, having at the same time been preceded by storms, earthquakes, clouds of locusts, lasting in all 15 years. Names such as the 'Long Plague' have been given to it. (Anglad's History of Epidemics)

The famous plague described by him became to be known as the Plague of Antoninus or of Galen. Ammianus Marcellinus the hero philosopher claimed it originated from a chest which the soldiers had looted from a temple at the capture of Seleucia. The ramifications of this outbreak were enormous and it was said to have spread from Persia to the Rhine finally reaching Rome. Marcus Aurelius records 'the corpses were carried in carts and waggons' while Orbsius claimed that so many people died that the towns fell into ruin; so severe was the army of Marcus hit, that the campaign against the Marcomanni had to be postponed.

However in 169 A.D. the war was resumed. Haeser records that many of the Germanic warriors were found dead in the field 'without a wound upon their bodies'. Marcus Aurelius contracted the disease himself and would not see his son, or take any food. He died in a

(29) Greek Medicine . 114. Rome. Brock A.D.

(x) Chadwick Lect. Lancet. June 3. 1906

matter of days. Galen's description was written at this time (Methodus Medendi). Many records have it that the plague raged for 14 years.

Dion Cassius tells of how it broke out again in 180 A.D. in the reign of Commodus. The average death rate being 2,000 persons per day in Rome. Galen writes of 'inflammation of the pharynx, fever and diarrhoea'. On the ninth day an eruption sometimes 'pustular', though more frequently dry broke out on the skin. It has been suggested that small pox was the nature of the disease.

In his recording Dion Cassius also admits to this high daily mortality. He relates 'violent sickness' in Rome. 'But many died, not only in Rome, but in all parts of the Empire, in another manner: scoundrels poisoned little needles with noxious substances and transmitted the disease in this way for pay. This had already been done in the reign of Domitian.

People clamoured for a victim, a pleasant sacrifice was handy in the Phrygian freedman Cleander, the greedy and infamous minister of Commodus. The emperor fearful for his own life, at the instance of the court women demanded the head of Cleander be thrown to the populace. Commodus on the advice of his physicians retired to Laurentum, a cool place beautifully situated and shaded by laurels, on the supposition that the sweet smell of these plants would ward off the plague.

Those who remained in Rome were advised to stuff their noses and ears with sweet smelling ointments and to use perfumes, in the vain hope of preventing infection from the effluvia which pervaded all Rome at that time.

Certain scholars have the opinion that Galen quotes 'verbatim' from Thucydides. For example he says that the sick mans body did not seem hotter than normal to the touch but that he suffered an intolerable burning. The skin was not yellow, but reddish and livid. The transference of οὐτέ τι χλωρόν from Thucydides points out the fact that he did not describe what he saw.

Galen advocated the 'Armenian bole', an anti-pestilential specific in striking contrast to the crude disavowal of all remedies by Thucydides. In his *De Simplicium Medicamentorum Temperamentis et Facultatibus* he quotes 'that all who used it (Armenian bole) were promptly cured'. Those who felt no affect from it died.

(Armenian bole was an argillaceous earth from Persia and which owed its colour to red oxide of iron)
The question has often been asked, if the medicament was so powerful in the curative sense, then why did Galen leave his charges in Rome at the time of the plague and journey home?

From Ethiopia came yet another pandemic, describe by St. Cyprian, and which raged for some 16 years, passing to

Egypt thence to Europe. *Cedrinus* made the astute observation that infection was transmitted by direct contact i.e. clothes. (Life of Gregorius *Thaumaturgus* Patrologia Graeco. Gregorius iii) The former being by Gregory of Myssa and from which the following extract came:

"When once the disease attacked a man, it spread rapidly over his frame: A burning fever and a thirst drove him to the springs and wells; but water was of no avail when once the disease had attacked a person. The disease was very fatal. More died than survived, and not sufficient people were left to bury the dead.^x (Eusebuis also records this)

In 256 A.D. it appeared after a gathering of a great crowd in a theatre, as a punishment for the timerity of the spectators in challenging Jupiter, in whose honour the performance had been given.

St. Cyprion made many converts to the Christian faith in his exorcism of the evil spirits. This showed an all too frequent reaction after great calamities.

St. Cyprion's description was as follows (De Mortalitate):

"The bowels relaxed into a constant flux, use up the strength of the body. A fire, conceived in the marrow, ferments into wounds in the jaw. The intestines are shaken with continual vomiting. The eyes burn with blood.

(x) Resembles the Plague of Athens.

Sometimes the feet or other parts of the limbs are cut off because of the infection of the disease (acusing) putrifaction (Morbida putredo)" There was also evidence of deafness and blindness with paralysis. No skin eruption was present. Cholera has been suggested as the nature of the disease.

Diocletian had now taken the reins of emperorship becoming famous during his reign for three things, his reorganisation of the Imperial system, his persecution of the church and his final retirement into private life. (30)

All mutiny and disorder were to cease. He devised a system of two colleague emperors, each with a 'Caesar', an heir to succeed him - all four to be surrounded by oriental pomp and mystery. From now onward the Emperor was to be aloof and above all men, a very different state of affairs from those of times of August and Vespasian who were more 'Chief citizens' rather than sultans. Legions were divided, civil and military administrations were separated. Concentrations of power in the hands of individuals was divided so that, rebel leaders could be easily dealt with. For a time this system meant law and order, but soon broke down at the top, the Emperors' plans failed and resulted in civil war after the retirement of Diocletian. Divided loyalties were to generals, causing, this once whole compact Empire, to resemble a jigsaw puzzle which never again became a total picture until

Constantine became sole master.

Christians had been tolerated and made welcome, worship Christ by all means, but they must also worship the gods of the State. In Trajan's letters to Pliny their position appears to be uncertain. The Christian at that time was struck on the mouth and ~~were~~ bundled out of the court; now however edicts of persecution were issued, churches burnt, scripture burnt, and most terrible of all the Christians were massacred. One may sum up these feelings found in a phrase more than a thousand years later by a French scholar "Sire" said Theodore Beza to the French king "it belongs to the church of Christ, for which I speak, to receive blows rather than to deal them; but your Majesty will remember that it is an anvil which has worn out many hammers.

On or about the ascent of Constantine, Eusebius and G. Cedrenus gave accounts almost agreeing in the description of an epidemic which again superimposed itself upon these tempestuous social conditions.

Eusebius records;

"At this time almost every evil that can be enumerated fell upon man, famine, (oimos) and drought, with misfortune of a certain disorder; it was an ulcer, the domination of which was answerable to its affinity with the fiery anthrax, spreading over the whole body: it proved highly dangerous to the person affected, but by a particular determination to the eyes in most cases, it produced blindness

in thousands of men, women and children.

Nicephros relates;

"It originated in famine, and was called anthrax; it was an ulceration attracting or draining out tumours, with an intolerable stench, which in spreading over the body, extended to and affected the eyelids, and occasioned blindness both in males and females."

Both Eusebius and Cedrenus say also that the army of Gallienus in Armenia was affected.

Diocletian according to Cedrenus died of the malady.

"He was affected by severe pains over the whole of the body a violent 'phlogosis' preyed upon his inward parts, and his flesh melted like wax." In the progress of the complaint he became totally blind, his throat and tongue putrified 'so that the worms came out of his mouth' and he emitted an odour not less offensive.

From this description which is no doubt very accurate since the description of such a condition in the body of an Emperor would be most meticulously recorded.

Confluent small pox may fit this case diagnostically while the former recorded by Nicephros could have been anthrax since animals were said to have died from its virulence.

Constantine the great healer made history. He united the armies, welded the Empire, previously chopped up by Diocletian into a compact fighting unit both in a military sense and a civil one. Conscience had been involved in the attempted

destruction of the Christian church. Hence he issued the Edict of Milan giving full freedom to the Christians thus opening a new era. The god like state, hierarchical and controlled saw something beyond its reach - the domain of conscience. All was not as well as the Emperor expected in his liency. He fell on the stumbling block of Arianism and philosophic conditions. Not dismayed Constantine called the Council of Nicaea to settle fundamental questions. Arianism negated the Christian teaching; it made Christ indistinguishable from the gods of the Neo-Platonists. The issues of the famous council is still vital to the present day Christians. When Constantine died he left the world a legacy of tolerance and a dictum that 'a chain is as strong as its weakest link'. (337 A.D.)

On the succession his three sons faced a time of civil war. The frontiers were no longer quiet, Julian (later Emperor) crushed the offending tribes in Gaul. The Goth now friendly ,now at war came under the influence of Ulfila's translation of the Bible. Ulfila's Christianity however was one of Arian heresy and formed a blockade against the Empire. The terrible Huns who knew no mercy swept down from Asia upon Rome. Trajan and Theodosius the governing Emperors saved the day. They knew the arts of war but were also aware of the art of keeping the peace. The thrones of Trajan and Theodosius became vacant. Pacification of the Goths now gave rise to death and plunder

as they descended upon Constantinople under Alaric the Bold. Bribed he kept him from destroying the city but in 410 he sacked Rome. Carthage fell by trickery to the Vandals under Gaiseric their king. In 451 A.D. Attila determined with his Huns to break the Western Empire first, but without reason he withdrew from Italy after his attack on Gaul. The Vandal came again but now the power of Rome was almost at an end and the barbarian kings sat on the thrones of both East and West.

Historians have written of the great devastation wrought in this last era in the greatness of Rome. At one time her soldiers had sat by the waters of Babylon or strode across the Yorkshire moors', but now they had been submitted to harder taskmasters who had destroyed their beautiful cities, their fine highways, caused neglect of the fields, reduced their families into poverty, deprived them of their stored foods to create famine the extremity of such that necessitated the eating of children and as Diodorus recounts "men fed with fury upon each other" (443 approx.).

Constantly earthquakes shook the earth, Vesuvius erupted time and time again, while both Antioch and Constantinople suffered greatly both from plague and earthquake. Finally there was the 'great Plague' in the time of Justinian the Emperor and builder of St. Sophia.

This pandemic is certainly the first to be recognised
(31)
as true plague is, 'P^eumonic' and 'Bubonic'

(31) G. Auden. *Historical Epidemiology*. N. Press JA 3. 1945

Geoffrey de Tours depends for his description upon Procopius, as also does the Emperor John Cantacuzenos who writes, (It is said that the plague followed the usual pattern starting from the coast and thence moving into the interior)

Symptoms. "Sudden fever. Some on waking others when walking about having no reference to whatever they were doing. The body showed no change in colour nor was it hot as might be expected from fever which was in conspicuous till the evening. In the same day in some cases in others the following day and others not many days after, a 'bubo' showed itself (the word boubon means the groin). Not only in the groin but also in the axilla and in some cases beside the ears. Then followed deep coma, yet others had violent delirium. Loss of memory of close contacts. There were hallucinations, excitements and the fallings out of bed. Anorexia was present. In some cases crops of black pustules the size of lentils with the vomiting of blood. This was a bad prognosis."

The account tells of Justinian appointing special plague officers to dispose of the dead. These officers stripped off the roofs of the fortifications in Galata, then filled them up with the dead, replacing the roofs later and leaving the bodies to rot.

G. A. Auden quotes 'Wu lien Teh' who believes that the plague began its west drive from endemic areas in Central Asia. The pandemic had all the classic features of plague, bursting upon each town in a fury and covering scattered foci.

The tendency of epidemicity may perhaps be taken as an additional argument against the plague supposition for the Athenian outbreak - the latter seems to have been confined to the Athenian army and did not spread out into the surrounding districts and disappeared after the seige.

The means of spread in plague requires the rat vector.

G. Auden in his essay goes on to say that the black rat may not be the only species to spread Plague. Rodentia has the greatest distribution in the world (180 species in the genus muridae. (rats and mice)).

He also cites Wu Lien-Teh who has given evidence that a Californian outbreak of Plague was due to a squirrel vector. Procatus writes,

In the second year in the spring it reached Byzantium and began in the following manner: "To many there appeared phantoms in human form. Those who were so encountered, were struck by a blow from the phantom, and so contracted the sickness. Others locked themselves in their houses. But then the phantoms appeared to them in their dreams, or they heard voices that told them that they had been selected for death"

(32)

One of the most reliable authorities on this plague is Seible (Die Grosse Pest zur Justinians) quotes also that there was a succession of earthquakes - volcanic eruptions and famines which brought destruction through Europe, the Near East and Asia for 60 years.

Gibbon also quotes this plague but he has been maligned

(32) De BELLO PERSICO.

in his description by others since he was not a medical man and hence did not pay attention to the true medical nomenclature.

Figures given for the numbers of deaths vary greatly. Some say 10,000 persons per day died.

Plague and Rats.

The word 'plague' has been used with great liberality up to the present point in this survey of epidemics in the Graeco-Roman times. To us at the present day it is a specific disease with definite clinical symptoms and signs, being carried by the rat flea to humans, while the bacteria which causes the disease have particular morphological characteristics not to say anything of its growth on culture media.

The ancients may have talked of it as the 'pestilence which walketh by night' or the 'borch of Egypt' the 'plagues' of locusts but whatever the true nature, it was a punishment of man for his sins.

The derivation of this word is most interesting and it also signified very acutely what it meant.

Plague: English: from Plaga. Greek: $\pi\lambda\eta\gamma\eta$ a blow.

German: Plage: Fleau derived from Latin 'flagellum' and

Greek $\theta\alpha\lambda\alpha\sigma\sigma\alpha$ - a flail.

Let us now look into the history of the vector factors, mice and rats.

In the Book of Samuel (900 - 200 B.C: 7cens) there is a reference to 'mice that mar the land' and ancient literature abounds with incidences but there is also confusion

in the true identification of these pests i.e. whether they were rats or mice is a matter for interpretation.

The Jews considered all so called mouse varieties unclean. Worshipers of Zoroaster hated the water rat and to kill them was doing a service to the gods.

Heredotus mentions. $\nu\bar{\upsilon}\varsigma$ α $\rho\omicron\nu\mu\alpha\tau\omicron\varsigma$ Field mouse.

The Greek word was $\nu\bar{\upsilon}\varsigma$ but they also knew $\upsilon\mu\alpha\chi\epsilon\varsigma$ later known as Roman 'Sorex' or field mouse. (shrew)

There is a story of Heliogabalas whose real name was Marius Avitus a native of Emesa and who fled from Rome to his native city after the murder of one Coracola. He became high priest to the sun god (of Syria) Elagabalas his assumed name. When he returned to Rome he staged a fight between 10,000 mice and 1,000 shrew mice, and one thousand weasles⁽³³⁾. No doubt such a spectacle amused the court at that time.

References are also to be found in Aelian xvii. 41, Aristotle Hist. Animals vi. 37 580 B; the works of Pliny and Theophrastus.

Strabo, Geographica x iii I 48 (Falconer translation) relates that the temple of Apollo Smintheus is in this Chrysa, and the symbol, a mouse which shows the etymology of the epithet Smintheus, lying under the foot of the statue.

The Teuceri who came from Crete were directed by an oracle to settle wherever the earth born inhabitants should attack them. Historians are of the opinion that this came to pass near Hamaxitas.

33) Die Antike Theirwelt. Keller.

In the night time great multitudes of field mice came and devoured all arms and utensils which were made of leather.

The town of Hamaxitas also had a temple to Smintheus Apollo, and it is believed that the inhabitants kept tame rats at the public expense, while the picture of a rat had an honourable position near the tripod of the god.

In the Aolic dialect *σμίς* means a rat. Apollo stood in the same relationship to the mouse, or it appears to be, as Aesculepius did to the serpent.

Plutarch asserts that the Persian 'magi' killed all rats and mice because they and the gods they worshipped entertained a natural antipathy to them. This idea was also held by the Arabians and the Ethiopians. It is curious to know what may have been the real grounds for antipathy for which Plutarch advances his current explanation. More than likely it was perhaps the experiences with these animals that showed that they were in some way connected with famine and plague. (34)

The Romans had a word 'musculus' (little mouse). Martian is said to have used it as a term of endearment. The root 'musli' is Persian.

'musa' 'musi' are both Hindu derivations. The Hindus had a wide knowledge of both the rat and mouse. (34) Plagues and Pestilences in Literature and Art.

Crawford. 1914-26.

Yet in the light of present day knowledge of the habits of these animals, there must have been a large influx of them into Rome and the great cities from Egypt as the grain which the Empire used came from that land.

According to the wisest scholars the rats or rat like animals were not to be found in Europe till after the Crusades. It is also claimed that the first rat was 'mus rattus' the black rat, and also a ship rat by habit. The probable date of entry into Europe being between 500 and 1100 A.D. and come with the hordes which crushed Rome, Constantinople and Alexandria into the dust. (Volker Wonderung)

The rat is not mentioned in the Epinal Glossary of 700 A.D. but 'raet' is denoted in the vocabulary of Archbishop Alfric 1000 A.D.

Hamilton and Henton say the first difference between rats and mice is to be found in the writings of Giraldus Corbrenses (1147-1223).

The ship rat spread all through the Mediterranean and its arrival by sea was witnessed by name. $\pi\sigma\upsilon\tau\eta\kappa\omicron\varsigma$

It would not be complete to remain at the points of derivation, but it would call for completeness to continue with the study of the black rat in years long after the Graeco-Roman Period.

The black rat was wiped out or nearly so by the hordes of brown rat 'Mus Decumanus' a ferocious short nosed short tailed Asiatic type which swept across the Continent in the 18th century.

'Mus Rattus' are now only found in small groups along the littoral, in sea ports, islands off South America and other tropical regions where it is not confined to a parasitic life in competitive living with the more barbaric and larger rivals. This rat however maintains its great superiority in ships where because of the climbing abilities it can still hold its own.

The 'brown' rat probably originated in China - Mongolia - and the region East of Lake Baikal.

Claudius AELIANUS in his *Die Animalum Natura* - speaks of "little less than Ichneumons making periodical raids in infinite numbers" in the countries along the Caspian "swimming over rivers holding on to each others tails".

In *Plagues Past; Present and Future* the writer notes three important points. ^(35a)

- i) The early association of rodent with plague.
- ii) Presence of both pneumonic and bubonic forms of the disease in many epidemics.
- iii) Periodicity of 'plague' which is unlike that of any other disease.

(36)

Papon T.P. made a comparative and comprehensive study of records of pestilences of various kinds. He gives 41 epidemics in the course of 1,500 years before Christ. Mostly among the people bordering the Mediterranean.

109 pestilences in the first 1,500 years of the Christian

(36) "De la peste en epoques memorables de ce Fleau.

(35a) B. J. Loyd.

era and 45 pestilences from 1500 - 1720 A.D.

There is little doubt that of these epidemics, plague played a great part in decimating the citizens of the Graeco-Roman period.

One could add the conditions which bring about this type of disease with modern investigations into the habits and population recordings of the Rodents. These are:-

- i) Rodents.
- ii) Ectoparasites of man. The flea, lice, bed bugs.
The seasonal prevalence of dominant species of fleas and the ability to propagate at lower temperatures.
- iii) Housing conditions. Types of buildings frequented by rats.
- iv) Condition and construction of grain houses.
- v) Condition and construction of houses wherein food is stored, manufactured, served or distributed.
- vi) Condition and construction of wharves and of stables.
- vii) Garbage and its disposal.
- viii) Maritime and to a lesser extent other forms of transportation of foods particularly grain.
- ix) Human factor in spread of pneumonic infection.
- x) Carriers of plague, rodent or human.
- xi) Epidemic centres of rodent plague.

Rats destroy cultivating grain, seeds, sprouts and in one year may eat 40 to 50 lbs of Indian corn. They destroy clothing, books, leather, fruit, poultry, ducks and pigeons eggs, bulbs,

Bishop of Avenches or Lousanne.

wood, walls and even have been known to attack men.

Rufus of Ephesus (2nd cent. A.D.) quoted by Orbasius (325-403 A.D.) mentions the word 'bubo' flexit.

"pestilen tial buboes extremely fatal and acute" were found in Libya, Egypt and Syria. 3rd cent. B.C. He also quoted the accounts of Dioscorides and Panner in 1896 Poseidorias two physicians at the court of Alexander, near the beginning of the Christian era. Disease was characterised by:

- buboes not only in the groins but also popliteal spaces and elbows"

During this essay 'small pox' has been mentioned many times. The first mention of this term appears to have been written in a letter by Pace, Dean of St. Pauls, to Cardinal Wolsey 14 July 1518: It was then written 'Small pokkes'.

Later 'small poxe' 1603 in a Treatise by Thomas Gardonatus holds that the plague which infected the Greeks before Troy may have been salaria. It is quite possible that

'pack' or pocket occurs in the Anglo-Saxon 'Leechdoms' i.e. leechdom against poc adle (poc disease) (9th century).

Much later (1497 approx.) in Paris, the words 'la grosse verolle' (syphilis) and la petite verolle (small pox) appeared in an ordiance of Parliament.

'Variola' occurs for the first time in the 6th cent. and is said to be due to the writings of Marius,

Nothing of importance regarding the marketing of 'agues'

Bishop of Avenches or Lousanne.

"an 570 -

Hoc anno morbus validus, cum profluvio ventris et variola, Italiam Gallianique valde afflexit."

There is little doubt that small pox existed in the Graeco- Roman period. Cases cited give pictures almost identical to those of the present day. Jenner in 1896 made medical history when he demonstrated his vaccination technique. Earlier Buist of Edinburgh revealed by his special staining methods the elementary bodies so characteristic of virus culture in living tissue. (1886. Buistia pascheni)

Present day investigators may now see the actual virus by means of the electron microscope.

Malaria in Greek History.

The first mention of fever $\pi \upsilon \rho \epsilon \tau \circ \varsigma$ 'puretos' is to be found in Homer's Iliad Chap.xxii 31. The word does not occur again until the period preceeding the 5th. century B.C. and Cardomatous holds that the plague which infested the Greeks before Troy may have been malaria. It is quite possible that the surrounding ground on which the army was pitched was a focus for the mosquito as the ground was marshy by nature. Hesiod mentions diseases two or three times but the nature of them is one of supposition. Hesiod lived in Boetia where the ground was also marshy and favourable for mosquito propagation.

'Epiates' was used by Homer and Hesiod to mean 'ague'

Nothing of importance regarding the mentioning of 'agues'

Plato in his *Timaeus* classified disease according to the happened or was written between Hesiod and Theognes.

Theognes was a supporter of the oligarchical party in Megoria, and he enlarged upon the miseries awaiting the citizen who is not wealthy and he asserts that nothing crushes a good man so much as poverty, neither old age nor yet $\eta\pi\alpha\lambda\omicron\varsigma$ - epialos, which was of uncertain history and often confused with ephialtes.

In ancient Greek mythology there was a giant Ephialtes, and a demon Epiales who sent and caused nightmares and shivers which were sometimes called 'epiales.'

Hesychuis called $\eta\pi\alpha\lambda\omicron\varsigma$ shivers which preceeded fever.

Diodorus and Strabo mention the unfortunate position of Syboris. The town was in a hollow, in the summer it was very hot at mid-day and cold in the morning and evening. Hence the saying "he who did not wish to die young ought to avoid in Syboris, seeing the sun either when it rose or set. (Chill precipitates attack of fever and Aropholes bite at night).

Certainly the town would not have been malarious at first, since the Greeks were wise in their choice of sites.

In *Oedipus Tyrannus* (Sophocles) there is mention of a disease which 'blighted the barren pangs of women' (may be reference to malaria in child birth). Aristophanes in the *Wasps* in the chorusing about Philocleon.

'but perhaps say they ' he has a swelling in the groin, or may be the escape of that rascal yesterday has vexed him so, that he lies sick with the fever' ($\pi\upsilon\pi\epsilon\tau\omicron\varsigma$).

Plato in his Timaeus classified disease according to the excess of one element over another. a) Continuous (καὶ συνεχὲς) and fevers (πλάγες) τὴν πυρετὸν caused by excess of fire. It may be concluded therefore from both the medical and non writers that malaria was prevalent and rife throughout the Greek world before 400 B.C.

In the Hippocratic Corpus in the first Book of Epidemics fevers were divided thus, (37)

- i. Continuous. (ὀννεχέες)
- ii. Quotidians ()
- iii. Semi-tertians (ἡμιτρίταιοι)
- iv. Tertians (τρίταιοι)
- v. Quartans (τεταρταῖοι)
- vi. Quintans (πεντηταῖοι)
- vii. Septans (ἐβδομαῖοι)
- viii. Nonans (ἐναταῖοι)

In the above there is a great debate as to the true division of terms. The burning disease καὶ ὄρος. Intense feeling of heat is found many times in the Corpus. Probably the accompanying symptom of typhus or typhoid fever.

Galen distinguishes very carefully the different types of fevers and his influence is very noticeable on many of his successors, Orbasius, Aetius of Amidea, Paulus of Aegina and Palladius who wrote a treatise on fevers.

Hippocrates says that people who live in too moist and hot districts and drink stagnant water, of necessity, suffer from enlarged spleens (37) Jones W.H.S. Malaria and Greek History.

They are stunted, ill shaped, have dark flesh and are bilious rather than plegmatic. In nature they are cowardly, averse to hardship, but good dicipline can improve their character in this respect.

From this one can glean that such a disease, if it be malaria, caused degeneration of both morals and art. (Marlequis)

Plato, 'the most pertinent evidence' declares humour of acid and salt phlegm and such a bitter and bilious, when no outlet for them from the body can be found, befog the same and produce manifold divices, ~~peev~~ishness, melancholy, rashness, cowardice, forgetfulness and stupidity.

After the 5th century A.D. there was a change in the Greeks, and also to a greater degree in the 4th century A.D. They lost their brilliance, their literature fell to a low level, their initiative vanished, patriotism became but an empty boast in public life from the struggle with Macedonia to the final conquest of Rome, a very marked difference from the days of Marathon to the Peloponnesion wars.

No doubt the material influences were great on the Greek peoples. Such conditions may have arisen from the silting up of rivers, to create larger marshes; about this period also there also appears to have been a general rise of the shores of the country. (38)

For example:

The celebrated pass at Thermopylae, the site of hot

(38) Ed. Med. Jnl.

springs, which lead from Thessaly into Locris, was in 480 B.C. defended by the 300 Spartans under Conidas against the mighty hosts of Xerxes. At this time the pass was about fourteen yards wide under the cliff.

In modern times the alluvial deposits by the volcanic springs, from which the pass has derived its name, has widened the land to a width of $1\frac{1}{2}$ to 3 miles of swampy marsh ground.

There are similar evidences elsewhere in Greece.

Thus it can be concluded also that Malaria was present among the Greeks during this era. Sir Clifford Allbutt (38a) had added that there is little evidence for the presence of Malta fever in central Italy in these times.

Dysentery was well known in Graeco Roman times continuing throughout the years to be recorded much later in the Middle Ages. In Rome Celsus gives an account of symptoms and the pathology. He describes ulcers of the intestine, discharges of sanguineous discharges, mucus and tenesmus.

Anthrax too has played a part in ancient times. Ovid makes reference to a very similar condition in the Plague of Athens.

Pulmonary tuberculosis no doubt was a permanent scourge in the Graeco-Roman period. Galen described tubers of the lung. ($\phi \nu \lambda \iota \sigma \sigma \alpha$).

(38a) Greek Medicine in Rome.

SURVEY OF SOCIAL CONDITIONS

The Greeks had been led to victory under Alexander of Macedon. They annexed the Persian Empire extending the 'poles' to the Indies and the Yaxartes.

Rome then conquered the Carthagenions and their Empire; gradually with an inevitable stride forwards they swallowed 'Old Greece' with its eastern appanages in the East and brought the barbarian Europe under her economical system.

Greece

Colonisation was the cry of the times. Hellenistic monarchs developed to the full the resources of their kingdoms, lands were cultivated and crops produced were improved upon. Yields of a high standard meant a full store house for the royal households. Iron replaced wood in the plough store, irrigation was improved upon; indeed the coffers of the Hellenistic kings were the first considered, as they also took a good share of the taxes which were collected in many ingenious ways.

Greek farms were to be found in India, these being run on specialised lines producing for the market.

New crops, cotton apricots and citron were introduced into European Greece, while improved stocks of horses, asses and swine were exported to Asia. Lucerne, oriental fruit trees, melons and beets and barnyard fowls from Greece into Italy. (39) No longer were the Greeks solely dependent

upon imported corn from Egypt which now imported olive oil, salt fish, pickled pork, honey, cheese, dried figs nuts and melons.

The technique of baking and milling flour improved by necessity in catering for the masses.

Ships of large displacement became quite a commonplace and these sought anchorage in harbours which boasted new wharfs whereon their cargoes could be unloaded. Navigation improved within the Mediterranean but without, journeys still took as long as it did in the earlier times.

Overland routes in Asia had post stations under the Hellenistic emperors. Roads first to be improved by the Persians, were later improved by the Romans in examples of their famous 'military roads'. It was boasted by Ptolemy that the roads radiating from Rome had been so graded that 'a waggon could take the load of barge.'

From the East poured in luxuries spices, drugs, ivory, and jewels from Africa, gold, furs or forest products from Siberia. Indeed the range of imports varied from birds of lovely plumage to amber and tin.

Slavery was an inevitable integral part of the Hellenistic system. At the Delos Marts, slaves from Germany, Africa, Arabia, Ethiopia, Britain could be bought. Their occupations varied from that of the prostitute to that of the doctor. Whatever their trade the slave bound or free brought with him or her the arts, crafts and religious practice of their native land.

Astronomy, mechanics, mathematics, botony, zoology, physiology, anatomy all made rapid strides forward.

Bath Herophilus and Erasistratos made important discoveries by dissecting human bodies. Egypt it is believed had a public medical service which was probably for the benefit of the Greek citizen while the slaves could care for their own ills as best they could.

These does not appear to be any evidence of measures taking against epidemics. The flea, louse and mosquito apparently went about their businesses unharmed. Human excrement was still regarded as the best form of manure so that there were days appointed for its collection. A veritable collection of epidemic focí.

Capitalistic farming displaced the peasant farmer who worked his own land. The bourgeoisie flourished, amply gave loans to the state, contributed to the adornment of their public buildings and schools.

The exploitation of slavery frequently led to revolts many of which assumed hugh and serious proportions but were suppressed by the state troops like 'cattle in the slaughter house'.

Zeno, a Phoenician from Cyprus lectured in the Stoa' against the social canker of slavery but his voice was lost in a wilderness of social inequality.

Pending economical and political problems and their issues were left unanswered as Rome cut them short by brutal annexation of the Hellenistic kingdoms in Asia Minor,

Syria and lastly Egypt.

Rome To the west the new masters thrashed all into submission. Gaul Britain, Germany, as well as Spain added wealth to Rome. The Roman although merciless in their conquests, built great cities, roads, drained marshes, and indeed improved the social conditions of their vassal states. Their cities, like that of the Greek had water supplies laid on to every house, baths, theatres and public fountains. The houses of the citizen were spacious, boasted frescoed walls, mosaic pavements and bathrooms. The slave worker, artisan lived in tenement houses unfortunately not so well equipped as that of the master.

Such an organisation as the Roman State was self sufficing. Slaves, furs and other produces came from the North Barbarians, in return for wine, pottery and metal ware, showing their economic system to be an open one.

As the Hellenistic empire had a large trade in luxuries, so it was also with the Romans. Parrots, ebony, ivory all came from China together with drugs.

It is rather strange to relate the fact, that, great though the Imperial Rome was, it made no outstanding contribution to science whether it be pure or applied. Indeed the Hellenistic genius was not improved upon or added to by its successor through battle. Studies in Medicine were encouraged by the Emperors, Military hospitals had efficient organisations of which the result were

hardly novel.

In the first and second centuries A.D. there is mentioned by various writers the existence of 'veletudinaria', which appear to have been private hospitals or 'nursing homes'.
(40)

The practice of medicine and surgery was left to the Greeks. But large navies and armies needed doctors. Vespasian in order to carry this supply of medical men to his forces, made provisions for teachers of medicine to be maintained at the public expense.

Of the great physicians who went to Rome, Asclepiades of Bithynia was perhaps the greatest. Physical therapy, sound diets, baths, massage and exercises were his chief methods of treatment. Simple though this appears, it was often thought better by other physicians to purge the patient with mysterious medicaments which frequently did more harm than good. Theriac was so used, containing long lists of ingredients which cured 'so few'.

Aretaeus, Hippocrates, Hemison, Celsus and Galen have gained a place in medical history by their accurate observations and untiring duty to their fellow men both in word and deed.

The position of the peasantry remained as it had done in Greece. Tiberius suppressed the right to strike and

(40) History of Medicine. Dr. Guthrie.

abolished the community of refugees in the temple. To the west in Britain, the native lived in the dirt of his own squalor. For the masses the living standard was low. Their chief diet being composed of wheaten bread, olives and figs consuming relatively little meat and wine, in miserably furnished rooms, heated only with braziers and lit with oil lamps. (41)

By the third century A.D. Roman economy began to show a deficit. Absentee landlordism, the decline of the urban industries, the decrease of the demand for goods within the Empire, the restriction of their families like their forerunners the Greeks who carried out in infanticide, all added to spell economical disaster. But as books 'must balance' taxation was the answer to the deficit. The balance fell upon the bourgeoisie. Guilds of craftsmen who had been free organisations became organs of the state. Employees of the state arsenals were bound to their employment as were textile workers and who were only allowed to marry into families of fellow workers. Finally the status of the worker of the state became so low that he was indeed a serf tied to his post by a cruel administrative chain.

In all such systems of political and economical totalitarianism, favouritism and corruption were evident.

(41) What happened in History by Gordon Childe.

The landlords of the great estates escaped, although they may have been called upon to provide recruits for the army from the tenants. Frequently the latter were protected from the civil tax collectors by the devices of the landlord. Free holders, urban workers who had been ruined, often quitted the decaying cities to hurry into the provinces to seek the protection of the landowners, a veritable 'shift of power' from the 'city financier' to the 'fuedal lord'.

The hordes could not be stayed any longer on the Empire borders. Barbarism soon razed the beautiful city, slew indiscriminately its builder, cast down the monument to comm^{er}ate ideology and beauty, submerging the new acquisitions of civilisation.

From such a picture it is easy to suppose that local famines could have taken place, reducing the peasant to a more miserable state than he formerly was, adding to his extreme susceptibility to contract epidemic diseases with great facility.

No doubt diseases were carried from the four corners of the Empire by ship or mule caravan.

Transmission of infection no doubt was by agents such as water supplies, clothes, personal contact from cough droplet. Overcrowding, rat infestation, bad personal hygiene in the lower or serf states were all too obvious fac^e of contagion.

Few slaves were as fortunate as those on the capitalist farm of Cato, the enlightened Greek who provided his slaves

with sheets, blankets, mattresses and pillows.

The poor wretch who was seized by plague, small pox, typhus, typhoid or be it what it may, cast himself into the baths in public places to relieve his consuming thirst or to rid himself of the terrible internal burnings.

Little did his fellows realise the danger.

All too often kings, rich feudal lords and other wealthy classes, fled to the country far from the 'phantom' stalking their streets, little did they know of how their 'phantom' may have secreted itself in the hem of their togas or the hair of the animal they rode, or yet again in the sacks of corn they carried for their needs.

What then of the methods of prevention of epidemics and their cure. Unfortunately little is known of the former and it is doubtful whether there were any preventative measures. Cures on the other hand varied from drastic purges to the lighting of fires in the street.

(42)

There is an extract from Pliny Nat. Hist. xviii 86 wherein disease was transformed to an enemy by taking his nail parings in wax and placing them at his foe's threshold. Other practices such as nailing the 'plagues' into the ground, or confining them to the confines of a box were popular.

The carrying of a charm added no doubt to the patients' confidence in its patency of warding off the pestilence.

((42) Golden Bough. Chap. Transference of Evil.

Conclusion

In this the 20th. century we have in our possession the accumulated knowledge, written on stone, papyrus and paper, of the great investigators who have gone before. Many have died in their tasks in wresting from nature the secrets of the pestilential scourges so devastating to the society as a whole, creating in their train famine, demoralisation, death all too frequently being premature in youth, in men and women of distinction whether they be rich or poor and if the victim did not die left him or her with a disability which deprived them in many instances of happiness.

The society is not now confined to the walled cities of Athens, Alexandria or Carthage, but has spread because of man's ingenious ways of travel to become a universal society. Thus too has the responsibility of man increased that he cannot afford to exchange his sword for the plough share in his own particular community, in his struggle against the microbe and say to himself 'my work is complete for my own kind.'

To-day the traveller may eat his early meal of the day in one country and seek his rest in another some thousands of miles distant. So too can he carry disease into the remote corners of the globe either within his own body or within his brief case.

Man must not only record the fluctuations of his own population but also that of the animal vectors. His international barriers must be closely guarded and his laboratories kept well stocked with vaccines.

New techniques of investigation into the world of the microbe and virus can only add to mans security, the well being and happiness of the individual in his society.

The experiences of the past must not go unheeded for as Immanuel Kant pointed out 'the truth is only to known by experience.'
